UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF TEXAS
DALLAS DIVISION

THE BOARD OF REGENTS OF THE UNIVERSITY OF TEXAS SYSTEM and HYDRO-QUÉBEC,	§	
Plaintiffs,	§	
v.	§	**CIVIL ACTION NO. 3:06-CV-1655-B**
A123 SYSTEMS, INC., BLACK & DECKER CORPORATION, and BLACK & DECKER (U.S.) INC.,	§	
Defendants.	§	

MEMORANDUM OPINION AND ORDER ON CLAIM CONSTRUCTION

This is a patent infringement case that involves materials used in electrodes in rechargeable lithium-ion batteries. The patents in suit, U.S. Patent Nos. 5,910,382 ("the '382 patent") and 6,514,640 ("the '640 patent"),[1] are both owned by Plaintiff The Board of Regents of the University of Texas System and licenced to Plaintiff Hydro-Quebec (collectively referred to as "UT/HQ"). Plaintiff filed this patent infringement action on September 11, 2006. (*See generally* Pls.' Compl.).

[1]Both patents are contained in the parties' appendices. The '382 patent appears at Pls.' App. 1-18 and Defs.' App. A1-A18. The '640 patent appears at Pls.' App. 29-49 and Defs.' App. A24-A44. For the sake of simplicity, the Court will cite to the patents themselves rather than to the appendix.

Furthermore, when the Court refers to the '382 patent and '640 patent for purposes of this claim construction, it in fact refers to the reexamined versions of those patents. UT/HQ originally commenced this action on September 11, 2006 (doc. 1). Thereafter, Defendants successfully petitioned the Patent and Trademark Office ("PTO") to reexamine whether the patents were valid. (*See* Defs.' Op. Br. 5). During reexamination, UT/HQ narrowed the patents to overcome certain prior art and validity challenges. (*See id.*). As a result of the reexamination, the PTO issued a reexamined '382 patent, located at Pls.' App. 19-28 and Defs.' App. A19-A23, and a reexamined '640 patent, located at Pls.' App. 50-54 and Defs.' App. A45-A49.

UT/HQ accuses Defendants of infringing claims 1, 2, 6, 7, 9, 10, and 11 of the '382 patent and claims 1, 2, 3, and 24 of the '640 patent. (Pls.' Op. Br. 6). While the parties have agreed to constructions of much of the claim language in each patent, the construction of eight particular claim terms and phrases remains in dispute. This disputed claim language was the subject of the *Markman* hearing held on December 2, 2010 and is addressed in the parties' briefing filed in conjunction with that hearing. The Court turns first to the legal standards governing claim construction. It then announces the proper construction of the claim language of the patents-in-suit, first setting out the parties' agreed constructions and then turning to the proper construction of the terms in dispute.

II.

LEGAL STANDARD

Claim construction is the first step in the two-part analysis to determine patent infringement. *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1581-82 (Fed. Cir. 1996). Patent claims that are asserted to be infringed are first construed in order to determine their true meaning and scope. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 976 (Fed. Cir. 1995) (en banc), *aff'd*, 517 U.S. 370 (1996). Claim construction is a legal question that courts decide as a matter of law. *Id.* at 970-71. After the Court has properly construed the claims, they are then compared against the device accused of infringing. *Id.* at 976.

"It is a 'bedrock principle' of patent law that 'the claims of a patent define the invention to which the patentee is entitled the right to exclude.'" *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). Claim construction is simply a way of elaborating the normally

terse claim language in order to understand and explain, but not to change, the scope of the claims. *Embrex, Inc. v. Serv. Eng'g Corp.*, 216 F.3d 1343, 1347 (Fed. Cir. 2000) (per curiam). If the meaning of claim language is not readily apparent, the Court looks to the sources available to the public that show what a person of ordinary skill in the art would have understood the claim to mean. *Phillips*, 415 F.3d at 1314. The Court first looks to the "intrinsic evidence," which includes the words of the claims themselves, the specification, and the prosecution history. *See Vitronics,* 90 F.3d at 1583. Competitors are entitled to rely on this record and on the established rules of claim construction to ascertain the scope of the patent and thus design around the claimed inventions. *Id.*

The analysis begins with the words of the claim itself. *See id.* at 1582. "[T]he language of the claim defines the scope of the protected invention," and "resort must be had in the first instance to the words of the claim." *Bell Commc'ns Research, Inc. v. Vitalink Commc'ns Corp.*, 55 F.3d 615, 619-20 (Fed. Cir. 1995). Absent an express intent to impart a novel meaning, terms in a claim are to be given their ordinary and accustomed meaning. *Phillips*, 415 F.3d at 1312. The ordinary meaning of a claim term is the meaning a term would have when viewed by a person of ordinary skill in the art of the invention as of the effective filing date of the patent. *Id.*; *Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1325 (Fed. Cir. 2002). However, a patentee may choose to be his own lexicographer and use terms in a manner other than their ordinary meaning, as long as the special definition of the term is clearly stated in the patent specification or file history. *Vitronics,* 90 F.3d at 1582. Courts often examine the difference among claims to determine the meaning of particular terms used in any given claim. *Phillips*, 415 F.3d at 1314.

Although the court places great attention on the claims themselves, the claims do not exist in a vacuum. "Claims must be read in view of the specification, of which they are a part." *Markman*

v. Westview Instruments, Inc., 52 F.3d 967, 979 (Fed. Cir. 1995). "The specification contains a written description of the invention which must be clear and complete enough to enable those of ordinary skill in the art to make and use it." *Vitronics*, 90 F.3d at 1582. The specification is always highly relevant, has been described as "the single best guide to the meaning of a disputed term," and is typically dispositive. *See id.* "The claims are directed to the invention that is described in the specification; they do not have meaning removed from the context from which they arose." *Network, LLC v. Cent. Corp.*, 242 F.3d 1347, 1352 (Fed. Cir. 2001). One reason courts examine the specification is to determine if the patentee has limited the scope of the claims. *Watts v. XL Sys., Inc.*, 232 F.3d 877, 882 (Fed. Cir. 2000). At the same time, courts must be cautious not to import limitations from the specification in determining the meaning of terms used in the claims. *Comark Commc'ns, Inc. v. Harris Corp.*, 156 F.3d 1182, 1186-87 (Fed. Cir. 1998).

The Court may also consider the prosecution history of the patent. *Vitronics,* 90 F.3d at 1582. The prosecution history contains the complete record of all the proceedings before the Patent and Trademark Office ("PTO"), including any express representations made by the applicant regarding the scope of the claims. *Id.* It helps to demonstrate how the inventor and PTO understood the patent and also whether the inventor narrowed the scope of the claims during prosecution by limiting the invention. *Phillips*, 415 F.3d at 1317.

Intrinsic evidence alone will resolve any ambiguity in most situations. *Vitronics,* 90 F.3d at 1583.[2] Extrinsic evidence, such as expert and inventor testimony, dictionaries, and learned treatises,

[2]Indeed, in the instant case, the Court finds the intrinsic evidence sufficient to fully construe the disputed claim language and thus does not rely on any extrinsic evidence proffered by the parties for its claim construction.

is disfavored. *Phillips*, 415 F.3d at 1317. Extrinsic evidence should not be relied upon if the public record unambiguously describes the scope of the patented invention. *Vitronics*, 90 F.3d at 1583. At the same time, dictionaries and treatises can be helpful extrinsic evidence in claim construction, as they help courts better understand both an invention's underlying technology and the way in which a person of ordinary skill in the art might use the claim terms. *Phillips*, 415 F.3d at 1318. However, while dictionaries and treatises may be useful, they are less significant than intrinsic evidence. *Id.* at 1317-18. With that background, the Court now turns to its claim construction of the terms at issue.

II.

CONSTRUCTION OF AGREED TERMS

Based upon the parties' Joint Claim Construction Charts for the '382 (doc. 161-1) and '640 patents (doc. 161-3), the parties agree to and the Court adopts the following constructions of terms in the disputed claims:

Term/Phrase	Agreed Construction
"*ordered olivine compound*" '382 patent: Claims 1, 6, 10, and 11 "*ordered olivine structure*" '640 patent: Claim 1	a repeating arrangement of atoms in an olivine crystal form with a plurality of planes defined by zigzag chains and linear chains, where a first metal (M1) occupies the linear chains of octahedral sites and a second metal (M2) occupies the zigzag chains of octahedral sites, with generally no mixing between the two types of sites.
"*modified olivine structure*" or "*modified olivine compound*" '640 patent: Claims 1 and 3	a repeating arrangement of atoms in the olivine crystal form that is modified by substitution of one or more elements, with ions of the same or different charges, at either or both the catatonic (M2) or anionic (XO_4) site.
"*cation*" or "*cations*" '382 patent: Claims 1, 6, 10, and 11	ion(s) having a positive charge.

'640 patent: Claims 1 and 2	
"*a cathode in a rechargeable electrochemical cell, said cell also comprising an anode and an electrolyte*" '382 patent: Claims 1 and 10 '640 patent: Claims 1 and 3	a positive electrode (cathode) in a rechargeable electrochemical cell, which cell also contains, but is not limited to, one or more anodes (negative electrodes) and one or more electrolytes.
"*cathode comprising*" '382 patent: Claims 1, 6, 10, and 11 '640 patent: Claims 1 and 3	the cathode must contain the ordered olivine compound recited, but may contain other things as well, such as other cathode materials
"*selected from the group consisting of*" '382 patent: Claims 1 and 6 '640 patent: Claim 1	one member selected from (and only from) the identified group individually
"M *is Fe*" '382 patent: Claims 2 and 7	M is Fe and only Fe
"*secondary battery comprising an anode, a cathode and an electrolyte*" '382 patent: Claims 6 and 11 '640 patent: Claim 3	a rechargeable battery containing, but not limited to, one or more negative electrodes (anodes), one or more positive electrodes (cathodes) and one or more electrolytes
"*one or more . . . selected from the group consisting of*" '382 patent: Claims 10 and 11 **"***selected from the group consisting of . . . or mixtures thereof" and "a combination . . . selected from the group consisting of*" '640 patent: Claims 1 and 2	one member selected from (and only from) the identified group individually, or a combination of members selected from (and only from) the identified group.

III.

CONSTRUCTION OF DISPUTED TERMS

A. *General Challenge by Defendants That Neither Patent Covers Cathode Materials Containing Cobalt*

i. The Parties' Arguments

Defendants ask the Court to confirm that "[a]ll of the asserted claims of [the reexamined '382 and '640 patents] do not cover cathode materials containing cobalt (Co)." (Defs.' Op. Br. 8). Defendants contend that the prosecution history from the patents' reexamination unavowedly provides that UT/HQ disclaimed cathode materials containing Cobalt in order to ensure the validity of their claims, since prior art disclosed olivine cathode materials containing cobalt. (*Id.*). Defendants cite to nine statements by UT/HQ to the Patent and Trademark Office ("PTO") that cobalt is no longer contained in its claims. (*Id.* at 9). Defendants further cite to four statements by UT/HQ to federal courts that similarly denounce any claim for cathode materials containing cobalt. (*Id.* at 11). Finally, Defendants cite to the Federal Circuit's statement that "[a] patentee may not state during prosecution that the claims do not cover a particular device and then change position and later sue a party who makes that same device for infringement." (*Id.* (quoting *Springs Window Fashions LP v. Novo Indus., L.P.*, 323 F.3d 989, 995 (Fed. Cir. 2003))).

UT/HQ respond that Defendants' broad statement of patent scope is "legal error" in that it is wholly unattached to the particular claim terms of the '382 and '640 patents. (Pls.' Op. Br. 25). UT/HQ cite to two cases from the Federal Circuit, *Johnson Worldwide Assocs., Inc. v. Zebco Corp.* and *NTP, Inc. v. Research In Motion, Ltd.*, as evidence that a statement of claim scope in claim construction must be directly tied to the actual terms in the claims, not generally to "all terms" of "all claims." (Pls.' Op. Br. 25-26). UT/HQ also cite to the Local Rules' requirement that each party

"exchange a list of claim terms, phrases, or clauses that the party contends should be construed" as indicative of the need for statements from prosecution history to be tied to the construction of particular terms or phrases. (*Id.* at 27). UT/HQ alternatively maintain that Defendants' broad statement is contrary to the intrinsic evidence of the case. (*Id.* 27-29). They argue that the intrinsic evidence cited by Defendant (the nine statements to the PTO) only relates to the term "M" in the patents and says nothing about any other part of the claims. (*Id.* at 28). They also argue that the four statements made to federal courts refer to the meaning of "M" and are improper extrinsic evidence cited to contradict the unambiguous intrinsic evidence. (*Id.*).

While the parties' responsive briefs largely reiterate these arguments, Defendants do state, albeit in passing, that case law and the Local Rules do not forbid a general statement of patent scope during claim construction. (Defs.' Ans. Br. 4 nn. 2-3). First, they contend that there is no explicit prohibition in the Local Rules against broad statements. (*Id.* at 4 n. 2). Second, they argue that the *Johnson Worldwide* and *NTP* cases stand "for the basic proposition that it is improper to import limitations from the specification," not that a party must tie any limitation on claim scope to the particular language of the claims. (*Id.* at 4 n. 3).

iii. The Court's Analysis

The Court agrees with UT/HQ both that general, broad statements of patent scope are prohibited in a claim construction and that the intrinsic evidence relied upon by Defendants refers to the construction of the term "M" and should not be read as a broad limitation. As to a court's ability to include broad statements of patent scope in its claim construction, the Court finds the Federal Circuit's discussion in *Johnson Worldwide* to be particularly illuminating. In that case, the court stated that "claim terms cannot be narrowed by reference to the written description *or*

prosecution history unless the language of the claims invites reference to those sources." *Johnson Worldwide*, 175 F.3d at 989-90 (emphasis added). The court further explained, "[i]n other words, there must be a textual reference in the actual language of the claim with which to associate a proffered claim construction." *Id.* at 990. While, as Defendants note, the facts of *Johnson Worldwide* are not particularly analogous to the instant case, the Federal Circuit's ancillary explanation of the need for claim construction to be tied to particular claims is wholly apposite. Furthermore, it bears noting that Defendants have not cited and the Court cannot find a single case where a court in its claim construction has included a general statement of patent scope that is unattached to any specific term, phrase, or clause in a patent.

While the Court finds that a broad statement of patent scope regarding cobalt is inappropriate, it also notes that Defendants' reliance on the eight UT/HQ statements[3] from the claims' prosecution history is misplaced. Instead, those statements only refer to the exclusion of cobalt from the meaning of "M" in the '382 patent and "M, D, T, Q, and R" in the '640 patent. Thus, as discussed further below, the Court only considers those statements in its construction of those terms.[4]

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[3]While Defendants cite to nine statements allegedly from the patents' prosecution history, the ninth statement is actually the Declaration of Dr. Michel Gauthier, is extrinsic, not intrinsic evidence, and actually seems to implicitly refer to the term "M" as well. (*See* Defs.' App. A298, Gauthier Declaration).

[4]Even if the Court were allowed to make a broad statement of patent scope, Defendants' proposal that the claims do not include Cobalt is unfounded for the very same reason—the eight statements only refer to the terms M" in the '382 patent and "M, D, T, Q, and R" from the '640 patent. The parties have already agreed that cobalt is not included in the meaning of "M" in the '382 patent. (*See* Joint Claim Construction Chart (Agreed Constructions) for the '382 patent at 2 ("M is Fe" means "M is Fe and only Fe")). It is similarly clear from the '640 patent that cobalt is not included in any of the terms of the phrase "M, D, T, Q, and R." (*See* '640 patent's reexamination certificate 2:5-10 (removing Co from the group of metals that possibly define "M," removing Co^{2+} from the group of metals having a +2 oxidation state that possibly define "D," and including no other reference to Co in defining the terms T, Q, R, and X).

B. "compound"

Term/Phrase	UT/HQ's Construction	Defendants' Construction
"*compound*" '382 patent: Claims 1, 6, 10, 11 '640 patent: Claims 1, 3	a substance composed of atoms or ions of two or more elements in chemical combination	a homogenous, pure (except for incidental and immaterial contaminants) substance composed of two or more essentially different chemical elements, which are present in definite proportions

i. The Parties' Arguments in Support of Their Constructions

UT/HQ contend that separate construction of the term "compound"outside of the context of the phrases "ordered olivine compound" and "modified olivine compound," constructions of which both parties have agreed, is both unnecessary and improper. (Pls.' Op. Br. 12). UT/HQ further argue that even if a separate construction is warranted, its broad construction is the appropriate one. (*Id.* at 13; Pls.' Resp. Br. 15). For one, UT/HQ contend that the Federal Circuit has admonished against the approach Defendants take, limiting the construction of a sole term in the abstract ("compound") by other modifiers in the claim(such as "ordered olivine"). (Pls.' Resp. Br. 15 (citing *Phillips*, 415 F.3d at 1314)). Just as the Federal Circuit noted in *Phillips* that the term "baffles" in the phrase "steel baffles" "strongly implies that the term 'baffles' does not inherently mean objects made of steel," UT/HQ argues, so too the term "compound" when construed in the abstract should not be limited by any modifying language. (*Id.* at 15-16 (quoting *Phillips*, 415 F.3d at 1314)).

UT/HQ also compare the parties' constructions at length. First, UT/HQ point out that Defendants have engaged in "dictionary shopping," choosing a dictionary that conveniently adds the word "pure" to its definition, while UT/HQ rely upon the same dictionary that both parties use for

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Including a broad statement of patent scope absent any tie to the language of the claims themselves is thus contrary to both the facts of this case and the allowances of patent law in general.

their construction of "formula." (Pls.' Op. Br. 13). Second, UT/HQ maintain that the addition of "pure" to the construction of "compound" is improper because the very dictionary relied upon by Defendants states that crystals "inherently have imperfections and include impurities." (*Id.*; Pls.' Resp. Br. 17). Third, UT/HQ attack Defendants' inclusion of the parenthetical "(except for incidental and immaterial contaminants)" in their construction, arguing that the addition of this phrase is indicative of the fact that Defendants themselves acknowledge that purity is not required. (Pls.' Op. Br. 13). Finally, UT/HQ contend that inclusion of the phrase "pure (except for incidental and immaterial contaminants)" is a "muddled construction" that would only confuse a jury.

Defendants argue that a broad construction of "compound" ignores the claim language surrounding the term, which establishes that the claimed compounds "have a specific structure with a specific formula comprised of a limited number of elements, which are present in definite proportions." (Defs.' Op. Br. 12-13). UT/HQ's overly broad construction, on the other hand, would include any substance with any arrangement of elements. (*Id.* at 13). Thus, Defendants contend, adopting UT/HQ's construction would render the surrounding "olivine" claim language meaningless. (*Id.* at 14). In other words, by failing to include the phrase "homogenous, pure . . . substance," UT/HQ provides a construction from which it is impossible to determine the elements or proportions of elements for the compound. (*Id.*). Defendants also cite the patents' specifications as further counseling in favor of their definition of "compound," arguing that the specifications describe how the claimed olivine compounds work with certain structure and proportions and never describe how the compounds could function otherwise. (*Id.* at 15). Defendants point to the prosecution history of the patents as well, arguing that UT/HQ told the PTO that their patents covered compounds that had to have olivine crystal structures with "defined molar ratios." (*Id.* at

16). Finally, Defendants argue that their use of Van Nostrand's dictionary is proper because that dictionary is well-esteemed and most adequately defines "compound" for purposes of these particular patents. (*Id.*). Defendants do not respond to UT/HQ's argument that separate construction of the term "compound" is unnecessary given the fact that it is always used in the phrase "ordered olivine compound" or "modified olivine compound," both of which have agreed constructions.

ii. The Court's Analysis

The Court agrees with UT/HQ that separate construction of the term "compound" is unnecessary in light of the fact that the parties have already agreed to the constructions of "ordered olivine compound" and "modified olivine compound." In the patents-in-suit, the term "compound" is only used in association with those two phrases.[5] Accordingly, any separate construction of the term "compound" on its own would be meaningless—a jury ascertaining whether infringement occurred would have no reason to look at the separate construction. In fact, independent construction of a term that is only used in the context of a separately construed phrase would only potentially confuse and mislead a jury. Such a construction would invite the jury to reconsider the parties' agreed construction of "ordered olivine compound" and "modified olivine compound" and essentially encourage the jury members to engage in construction of their own. Such a result is untenable. *See Markman*, 52 F.3d at 970-71 ("[T]he interpretation and construction of patent claims, which define the scope of the patentee's rights under the patent, is a matter of law exclusively

[5]There is one instance where the term "compound" does not appear precisely in the phrase "ordered olivine compound" or "modified olivine compound." Claim 1 of the '640 patent states ". . . the cathode comprising *a compound of the ordered or modified olivine structure* . . . ." However, the parties agree that, for purposes of claim construction, this phrase references either an "ordered olive compound" or a "modified olivine structure." *See* Joint Claim Construction Chart (Proposed Constructions) for the '640 patent at 1 (citing claim 1 as references to each of those phrases).

for the court."). Accordingly, the Court finds that a separate construction of "compound" is not warranted.

C. *"formula"*

Term/Phrase	UT/HQ's Construction	Defendants' Construction
"*formula*" '382 patent: Claims 1, 6, 10, 11 '640 patent: Claim 1	a written representation using symbols of a chemical entity or relationship	a written representation using symbols of a chemical entity or relationship. There are several kinds of formulas as follows: (1) Empirical: expresses in simplest form the *relative* number and the kind of atoms in a molecule of one or more compounds; it indicates composition only, not structure . . . (2) Molecular: shows the actual number and kind of atoms in a chemical entity (i.e., a molecule, group or ion)

i. The Parties' Arguments in Support of Their Constructions

UT/HQ similarly maintain that separate construction of the term "formula" is unnecessary because it only appears in the disputed claims within phrases that are separately construed below. (Pls.' Op. Br. 10; Pls.' Resp. Br. 17-18). Even if separate construction of the term is warranted, however, they argue that their definition "captures the broad, ordinary and customary meaning of the term," while Defendants' proposed construction provides the same exact definition but "arbitrarily include[s]" two examples of types of formulas (empirical and molecular) out of the five provided by the dictionary. (Pls.' Op. Br. 10). In other words, contend UT/HQ, Defendants' addition of language defining empirical and molecular formulas "adds unnecessary complexity and . . . is incomplete," as it adds unnecessary language and even then fails to provide a full definition that includes the other three types of formulas. (*Id.*). They further note that the inclusion of these

two types of formulas "offers no guidance to a fact-finder as to which type, if either, is relevant or useful to their task." (*Id.* at 11). Finally, UT/HQ argue that Defendants cite to no valid basis to construe "formula" outside of its "broad ordinary meaning," and thus "there is no compelling reason to add the selective and complicating extensions proposed by Defendants." (*Id.* (citing *Johnson Worldwide*, 175 F.3d at 989)).

Defendants contend that UT/HQ's proposed construction is in fact the incomplete definition, as it provides "only a fragment of a dictionary definition." (Defs.' Op. Br. 17-18). Instead, Defendants argue that the term "formula" should be construed in accordance with its context, which provides for specific formulas of the claimed olivine compounds—formulas which "use symbols to express the relative number and kind of atoms of specific elements in each claimed compound, as well as the actual number and kind of atoms of specific elements, in the olivine structure of those compounds." (*Id.* at 17). Defendants maintain that the specifications of the patents-in-suit provide examples of formulas that support the inclusion of language concerning the chemical composition and the number and kind of atoms. (*Id.* at 18).

ii. The Court's Analysis

The Court finds that separate construction of the term "formula," unlike "compound," is necessary with the patents-in suit. While construction of "compound" on its own is unnecessary because it is separately construed in each occurrence in the claims, that is not the case with the term "formula." UT/HQ correctly note that the term "formula" is only used within the phrases "ordered olivine compound having the formula $LiMPO_4$ where M is a first-row transition-metal cation selected from the group consisting of . . . ," "ordered olivine compound having the formula $LiMPO_4$ where M is one or more first-row transition metals selected from the group consisting of . . . ," and

"having a formula: $Li_xM_{1-(d+t+q+r)}D_dT_tQ_qR_r(XO_4)$." It is also true that each of these phrases is independently construed below. The problem, however, is that both parties offer constructions of the third phrase, "having a formula: $Li_xM_{1-(d+t+q+r)}D_dT_tQ_qR_r(XO_4)$," that *includes* the term "formula." (*See* Joint Claim Construction Chart (Proposed Constructions) for the '640 patent at 16 (UT/HQ proposing a construction that begins"the formula describing . . . ," and Defendants proposing a construction that begins"the formula composed of . . . ")). Thus, while separate construction of the term "formula" is not necessary for Claims 1, 6, 10, and 11 of the '382 patent (the claims with the "ordered olivine compound having a formula . . ." language), it is necessary for construction of Claim 1 of the '640 patent (the claim where the language "having a formula . . ." appears).

In their proposed constructions, the parties agree that a "formula" generally is "a written representation using symbols of a chemical entity or relationship." Their only disagreement is whether additional language defining empirical and molecular formulas is also proper due to the nature of these patents. The Court finds that the additional language is not warranted because it improperly limits the meaning of a separately-construed term by its limiting context. It is a general premise of patent law that general terms, when construed separately from any modifying context, should be given their "ordinary and customary meaning." *See Victronics*, 90 F.3d at 1582; *Johnson Worldwide*, 175 F.3d at 989. In *Johnson Worldwide*, the Federal Circuit observed that "[g]eneral descriptive terms will ordinarily be given their full meaning; *modifiers will not be added to broad terms standing alone*." 175 F.3d at 989 (emphasis added). The Court finds UT/HQ's analogy of the instant dispute to the construction of the term "steel baffles" in *Phillips* particularly fitting. In that case, the court observed that a claim's use of the term "'steel baffles' . . . strongly implie[d] that the term 'baffles' does not inherently mean objects made of steel." *Phillips*, 415 F.3d at 1314. So too, in the

instant case, the term "formula," construed on its own, should not be limited by surrounding modifying language. Instead, any modifiers have the power to separately limit the broad, general meaning of the term "formula" on their own. Accordingly, the Court rejects Defendants' proposed construction that adds language concerning empirical and molecular formulas and adopts the broader language of the construction offered by UT/HQ.

D. "ordered olivine compound having the formula $LiMPO_4$ where M is a first-row transition-metal cation selected from the group consisting of . . ." and "ordered olivine compound having the formula $LiMPO_4$ where M is one or more first-row transition metals selected from the group consisting of . . ."

Term/Phrase	UT/HQ's Construction	Defendants' Construction
"*ordered olivine compound having the formula $LiMPO_4$ where M is a first-row transition-metal cation selected from the group consisting of . . .*" '382 patent: Claims 1, 6	an ordered olivine compound constituting lithium (Li), one metal selected from the group: Fe, Mn, Ni, or Ti, and phosphate (PO_4), in generally equal proportions	an ordered olivine compound composed of atoms in the following relationship: only one lithium (Li), one and only one metal M (Fe, Mn, Ni, or Ti), and only one phosphate (PO_4) (and nothing else)
"*ordered olivine compound having the formula $LiMPO_4$ where M is one or more first-row transition metals selected from the group consisting of . . .*" '382 patent: Claims 10, 11	an ordered olivine compound constituting lithium (Li), one or more metals selected from the group: Fe, Mn, Ni, or Ti, and phosphate (PO_4), in generally equal proportions	an ordered olivine compound composed of atoms in the following relationship: only one lithium (Li), one and only one metal M (Fe, Mn, Ni, or Ti, or a combination thereof), and only one phosphate (PO_4) (and nothing else)

i. The Parties' Arguments in Support of Their Constructions

The parties' dispute revolves around the claim language shared by both phrases: "ordered olive compound having the formula $LiMPO_4$." UT/HQ aptly characterizes the parties arguments on this claim language as revolving around the question of whether it "permits impurities or is required to have the exact and precise formula $LiMPO_4$." (Pls.' Op. Br. 15). They maintain that in order to comport with physical realities, the phrase necessarily permits impurities. (*Id.*). Citing the same arguments and evidence they raised in defense of their construction of "compound," UT/HQ reallege that "no compounds, especially crystals, are pure and have exact and precise formulas." (*Id.*). Accordingly, they argue, the phrase "in generally equal proportions" is a necessary component of any construction. (*Id.*). In addition to the extrinsic evidence of crystals necessarily having impurities, UT/HQ also point to the specification's use of the term "general formula" as apt intrinsic evidence that the '382 patent "acknowledg[es] that all compounds have impurities and variations." (*Id.*). By adopting Defendants' construction, which "exclude[s] any compound that includes an impurity," UT/HQ urge, the Court would essentially be stating that the '382 patent claims nothing because such a construction would "exclude any compositions that actually exist in the real world." (*Id.* at 16).

Defendants argue that the '382 patent's claim language, specification, and prosecution history all require that the phrase "ordered olivine compound having the formula $LiMPO_4$" be construed as having "specific elements in definite proportions"—a 1:1:1 stoichiometric ratio. (Defs.' Op. Br. 19; Defs.' Ans. Br. 16). Nowhere, Defendants allege, do either of the patents-in-suit or their prosecution histories speak to the notion that all compounds have impurities, nor justify inclusion of the phrase "generally equal proportions." (Defs.' Ans. Br. 16). Instead, UT/HQ add that phrase (based solely on extrinsic evidence) in order to circumvent the strong intrinsic evidence that

challenges their position. (*Id.*). In fact, Defendants contend, the phrase "generally equal proportions" flies directly in the face of the patent's references to a stoichiometric ratio of 1:1:1. (Defs.' Op. Br. 20-21).

In terms of prosecution history, Defendants argue that during reexamination of the '382 patent, UT/HQ acknowledged that their claims were limited to compounds with Li, M, and PO_4 in a 1:1:1 ratio, and actually used that fact to their advantage by arguing that their claims were not invalidated by certain prior art compounds that did not have a 1:1:1 stoichiometric ratio. (*Id.* at 20). At no time during the patent's reexamination, Defendants contend, did UT/HQ suggest that the claimed compounds had elements "in generally equal proportions" or included impurities. (Defs. Resp. Br. 17). Defendants further argue that even if the Court were to accept the extrinsic evidence offered by UT/HQ, other pieces of extrinsic evidence indicate that UT/HQ's position is wrong as a matter of chemistry. (*Id.*).

Finally, Defendants argue that UT/HQ's focus on the specification's use of the term "general formula" is misplaced because it is neither referenced in the claims themselves nor supportive of the phrase "in generally equal proportions." Instead, it refers to a formula where an element is defined generally (like "M" in the disputed phrase) instead of specifically (like Fe, Ti, or a similar element would be). (*Id.*).

UT/HQ respond that Defendants' reliance on statements UT/HQ made during the '382 patent's reexamination concerning stoichiometry is inapposite. (Pls.' Resp. Br. 19). They argue that a mandated stoichiometric ratio is completely different from utter purity—"[a]ll crystals have a stoichiometric ratio, but none are pure." (*Id.*). Instead, they contend, the stoichiometric ratio reflects the fact that "amounts of lithium, metal, and phosphate are *nearly the same* (1:1:1)," meaning

that they can and do contain some impurities. (*Id.* at 20). Finally, UT/HQ contend that Defendants' construction "exclude[s] all embodiments having any physical reality," an option explicitly foreclosed by case law. (*Id.*).

ii. The Court's Analysis

The Court generally finds Defendants' arguments to be more convincing. As noted by UT/HQ, the parties' briefing centers on the question of whether the phrase "ordered olive compound having the formula $LiMPO_4$" "permits impurities or is required to have the exact and precise formula $LiMPO_4$." (Pls.' Op. Br. 15). However, the Court sees these questions as two separate examinations—one involving purity and the other stoichiometry.[6] UT/HQ make a similar observation in their Response Brief. (*See Pl.'s Resp. Br.* 19). The Court finds the best course to be separate consideration of these questions.

As to the question of whether "ordered olive compound having the formula $LiMPO_4$" requires that a compound have "the exact and precise formula $LiMPO_4$," Defendants point to several pieces of intrinsic evidence that support their proposed construction that requires specific elements in definite proportions. For one, they point to a host of formulas from the claim language itself ("$LiMPO_4$"), the '382 patent's specification, and prosecution history, all of which require a stoichiometric ratio of 1:1:1. UT/HQ concede that the claimed compounds require a stoichiometric ratio of 1:1:1, and the Court finds that Defendants' proposal best states that fact: "an ordered olivine

[6]While the Court realizes that the principles and arguments regarding these concepts almost always overlap, for purposes of this claim construction and to better parse the parties' arguments, it finds the more sensible course to be separate consideration of the questions.

compound composed of atoms in the following relationship: only one lithium (Li), one and only one metal M (Fe, Mn, Ni, or Ti [or a combination thereof]), and only one phosphate (PO_4)."

Where the parties disagree, however, is the language dealing with the purity question. UT/HQ contend that the parenthetical "(and nothing else)," which concludes Defendants' construction, improperly and unrealistically requires complete purity. Defendants maintain that UT/HQ's proposal of "generally equal proportions" casts far too broad a net for the patents-in-suit. In asking the Court to resolve their dispute regarding purity, the parties are essentially seeking the Court's resolution of their underlying dispute of whether the patents-in-suit cover doping, the intentional introduction of impurities into compounds to maximize efficacy and performance. No matter how attractive finding an answer to this question at claim construction might be, however, the Court is limited to construing only the language of the claims themselves and examining only evidence relevant to that language. *See Johnson Worldwide*, 175 F.3d at 990 ("[T]here must be a textual reference in the actual language of the claim with which to associate a proffered claim construction."). The intrinsic evidence relied upon by the parties is insufficient to resolve this dispute. Furthermore, while the Court has expressly refuse to consider extrinsic evidence in this claim construction, it notes that even the extrinsic evidence as to purity is unclear and unhelpful.

In arguing that the Court's construction should contain the phrase "in generally equal proportions" to account for impurities, UT/HQ present two pieces of evidence: extrinsic evidence that all compounds and crystals have impurities and intrinsic evidence from the '382 patent's specification referring to the term "general formula." Neither of these pieces of evidence serve the purpose UT/HQ intends. In terms of intrinsic evidence, UT/HQ only point to the specification's use of the term "general formula." This reliance is misplaced. The Court cannot ascertain from the

parties' briefing what "general formula" really means. UT/HQ contend that the term demonstrates the patentees' realization that all compounds have impurities and variations. (Pls.' Op. Br. 15). Defendants argue that such a view is wrong and that the term "general formula" in fact refers to the fact that the claimed formula "$LiMPO_4$" contains a "general" element, "M," that can include one of a number of elements. (Defs.' Ans. Br. 16). This, versus a "specific formula" that recites an exact element for the formula. (*Id.*). The Court simply does not have enough information to resolve the ambiguity surrounding this term, and accordingly declines to adopt one definition over the other.

Neither do Defendants, in their proposal of "(and nothing else)," provide any intrinsic evidence as to purity. While the intrinsic evidence discussed in the context of "specific elements in definite proportions" above justifies Defendants' position with respect to that question, it does not speak at all to the issue of impurities. Thus, neither party has pointed the Court to adequate intrinsic evidence to support their proposed purity language, let alone whether the question deserves consideration in the adopted claim construction at all.

Instead, the parties rely on certain extrinsic evidence that speaks to purity. UT/HQ attack Defendants' inclusion of "(and nothing else)" on the basis of dictionary evidence that all crystals and compounds have impurities. Defendants concede the fact that impurities naturally occur in all compounds in their own proposed definition of "compound," where they include the phrase "pure (except for incidental and immaterial contaminants)." *See* Joint Claim Construction Chart (Proposed Constructions) for the '382 patent at 16. However, the simple fact that all compounds naturally contain impurities does not necessarily mean that the written claim construction expressly mention that fact. In fact, if the Court were to allow UT/HQ to use this dictionary evidence as the

sole evidentiary basis for inclusion of "generally equal proportions" in the claim construction, such a construction would cast a far wider net than anticipated by the claim language. As proposed, UT/HQ's construction would include any impurities present in the claimed compound, including those that are intentionally added. However, UT/HQ have provided no intrinsic or extrinsic evidence that demonstrates that the patentees anticipated such "doping." If anything, Defendants have provided extrinsic evidence that they did not. (*See, e.g.*, Zaghib, Mauger, and Goodenough Aricle, Defs.' App. A147, at A148 ("As a result, we argue that the combination of strong ionicity $LiFePO_4$ plus the strong bonding in the $(PO_4)^{3-}$ phosphate anions implies that aliovalent doping once envisioned to improve the electronic conductivity is impossible."); *id.* at A154 ("The impossibility for doping $LiFePO_4$ is then the combined effect of two features: the material is ionic, plus the P–O bond is too strong.").

Defendants offer their own extrinsic evidence that purportedly demonstrates that inclusion of "in generally equal proportions" in its construction improperly conflates the chemical concepts of formula of a compound and impurities in a material containing the compound defined by that formula. (Defs.' Ans. Br. 17). In particular, Defendants cite to a treatise that states that "a chemical compound always has a precise formula that never changes, regardless of whether there are impurities in the material or composition containing the compound having that formula." (*Id.*). Once again, however, this evidence speaks to the stoichiometry–definite proportion question, not the purity question.

In short, neither party offers any valid intrinsic evidence to support its purity language, nor does the extrinsic evidence they cite do any more than cast greater doubt on the propriety of

accepting either party's suggestion. Accordingly, the Court finds that Defendants' proposed construction is the correct one, though the parenthetical "(and nothing else)" must be removed.

E. "having a formula: $Li_xM_{1-(d+t+q+r)}D_dT_tQ_qR_r(XO_4)$"

Term/Phrase	UT/HQ's Construction	Defendants' Construction
"*having a formula:* $Li_xM_{1-(d+t+q+r)}D_dT_tQ_qR_r(XO_4)$" '640 patent: Claim 1	the formula describing a compound constituting lithium (Li), metal (M), one or more of D, T, Q, and R, and XO_4, where the proportion of XO_4, and the combination of M, D, T, Q and R are generally equal	the formula composed of atoms in the following relationship: one (1) or less unit of lithium (Li), one (1) unit of metals (which is a combination of at least two metals independently selected from M, D, T, Q and T that total one (1) unit of metals), and one (1) unit of XO_4

i. The Parties' Arguments in Support of Their Constructions[7]

The parties generally raise the same arguments concerning the construction of "having a formula: $Li_xM_{1-(d+t+q+r)}D_dT_tQ_qR_r(XO_4)$" in the '640 patent as they did with the "ordered olive compound having the formula $LiMPO_4$" phrases in the '382 patent. UT/HQ once again contend that their construction, with its inclusion of the phrase "generally equal" properly accounts for the physical reality that all crystals contain impurities. (Pls.' Op. Br. 17). Adopting Defendants' limited construction, UT/HQ argue, would have the undue effect of precluding any real world applications of the patent because it improperly "excludes variations and impurities by requiring precise

[7]Defendants originally combined their arguments on the proper construction of "having a formula: $Li_xM_{1-(d+t+q+r)}D_dT_tQ_qR_r(XO_4)$" and "$0 \leq d, t, q, r \leq 1$, where at least one of d, t, q, and r is not 0," but offered separate constructions. (*See* Defs.' Op. Br. 21-23). UT/HQ maintain that this is improper because the parties agreed to provide separate constructions. (Pls.' Op. Br. 20). UT/HQ ask that if the Court decides to construe the phrases together, it allow UT/HQ to provide additional briefing. (*Id.*). The Court finds additional briefing unnecessary because Defendants did in fact provide separate constructions (they merely combined the analysis) and because they provided separate analysis in their Responsive Brief. (*See* Defs.' Ans. Br. 18-21).

proportions between the elements." (*Id.*). As intrinsic evidence of their construction, UT/HQ cite to the fact that just like the '382 patent, the '640 patent uses the term "general formula" in its specification as well. (*Id.* at 18). This is in marked contrast to the intrinsic evidence cited by Defendants, they allege, which "says absolutely nothing about whether impurities and small variations are excluded." (Pls.'Resp. Br. 21). Similar to their arguments concerning "compound" and "formula," UT/HQ further attack Defendants' construction as improperly adding limitations from other claim language outside the phrase "having a formula: $Li_xM_{1-(d+t+q+r)}D_dT_tQ_qR_r(XO_4)$." (*Id.*; Pls.' Op. Br. 17). As an example, UT/HQ point to Defendants' inclusion of the phrase "one (1) or less unit of lithium (Li)" in their construction, a phrase that is based on "$0 \leq x \leq 1$," which the parties agreed not to define. (Pls.' Op. Br. 17). Once again, UT/HQ cite to the Federal Circuit's discussion of modifying language in the context of "steel baffles" in *Phillips*.

Defendants argue that the '640 patent, like the '382 patent, requires a 1:1 ratio of metal to polyanion. They maintain that construing the formula to only require that the metal and polyanion be "generally equal" instead of precisely 1:1 "would require the Court to ignore the clear and explicit language of the claims." (Defs.' Op. Br. 22; Defs.' Ans. Br. 19). Defendants again cite to statements made by UT/HQ during the reexamination process where examples of the formula always include a 1:1 ratio and never discuss impurities or slight variations. (Defs.' Op. Br. 23; Defs.' Ans. Br. 19). Finally, Defendants argue that construing the term Li_x to mean "one (1) or less unit of lithium" is appropriate because the claim itself, in saying $0 \leq x \leq 1$, limits the amount of lithium in such a fashion. (Defs.' Ans. Br. 19).

ii. The Court's Analysis

Because the parties' arguments are almost identical with respect to this claim language as they were with the phrases construed in Section D above, the Court once again generally adopts Defendants' construction.[8] UT/HQ once again rely on extrinsic evidence that all compounds and crystals have impurities and intrinsic evidence in the specification's use of the term "general formula" in the '640 patent. The Court remains convinced by Defendants' response and citation to the intrinsic evidence that indicates the patent claims a compound with specific elements in definite proportions.

The one aspect of the parties' arguments that is unique to the phrase "having a formula: $Li_xM_{1-(d+t+q+r)}D_dT_tQ_qR_r(XO_4)$" revolves around the term "Li_x." UT/HQ maintain that Defendants' definition of this claim as "one (1) or less unit of lithium (Li)" is yet another example of Defendants' improperly introducing limitations from separate phrases. (Pls.' Op. Br. 17). Defendants rely on the same case cited by UT/HQ, *Phillips*, in arguing that the Court can and in fact should consider the context of terms in interpreting them. (Defs.' Ans. Br. 19). Once again, the court finds UT/HQ's view to fall more in line with general claim construction principles. Defendants' proposal of "one (1) or less unit of lithium (LI)" improperly seeks to introduce the separate phrase "$0 \leq x \leq 1$" into the construction of "having a formula: $Li_xM_{1-(d+t+q+r)}D_dT_tQ_qR_r(XO_4)$." Instead, the proper construction, and the one the Court adopts, of "having a formula: $Li_xM_{1-(d+t+q+r)}D_dT_tQ_qR_r(XO_4)$" is "the formula composed of atoms in the following relationship: x units of lithium (Li), one (1) unit of metals

[8]Defendants' proposed construction of "having a formula: $Li_xM_{1-(d+t+q+r)}D_dT_tQ_qR_r(XO_4)$" does not include the parenthetical "(and nothing else)." While that parenthetical was the only reason the Court could not accept Defendants' proposed construction in its entirety before, based on other reasons unique to this claim language, the Court yet again cannot adopt Defendants' construction verbatim.

(which is a combination of at least two metals independently selected from M, D, T, Q and T that total one (1) unit of metals), and one (1) unit of XO_4."

F. "0≤d, t, q, r≤1, where at least one of d, t, q, and r is not 0"

Term/Phrase	UT/HQ's Construction	Defendants' Construction
"0≤d, t, q, r≤1, where at least one of d, t, q, and r is not 0" '640 patent: Claim 1	each of d, t, q and r are greater than or equal to 0, and less than or equal to 1. In addition, at least one of d, t, q, and r is greater than zero	the amounts of each of the metals d, t, q, and r in the formula may range from 0 to 1, provided the total of m, d, t, q, and r equals one unit in the formula. However, at least one of the metals d, t, q, and r in the formula is not zero (0), so the compound must at least contain a combination (totaling one unit) of M (on the one hand) and D, T, Q, or R (on the other hand)

i. The Parties' Arguments in Support of Their Constructions

UT/HQ first argue that this claim term is easily understood and does not require further construction. (Pls.' Op. Br. 20). They further contend that Defendants' proposed construction again unnecessarily imports limitations from another, already-construed phrase, where the plain terms of this phrase would not so limit it. (*Id.*). In citing to the "steel baffles" example from *Phillips* once again, UT/HQ point to Defendants' inclusion of the term "M" in their construction, a term that does not appear in the phrase "0≤d, t, q, r≤1, where at least one of d, t, q, and r is not 0" but is instead an imputed limitation from the separately construed phrase "having a formula: $Li_xM_{1-(d+t+q+r)}D_dT_tQ_qR_r(XO_4)$." (*Id.*).

Defendants contend that UT/HQ's proposed construction cannot be right because it would allow for "nonsensical" formulas wherein "$Li_xM_{1-(d+t+q+r)}D_dT_tQ_qR_r(XO_4)$" could have a negative value for M because there is no limitation that the sum of d, t, q, and r must be less than or equal to 1.

(Defs.' Op. Br. 23). They also defend their inclusion of the term "M" on the basis that "the claim term '0≤d, t, q, r≤1, where at least one of d, t, q, and r is not 0' necessarily relates to and includes 'M.'" (Defs.' Ans. Br. 21).

ii. The Court's Analysis

The Court once again agrees with UT/HQ that the general phrase "0≤d, t, q, r≤1, where at least one of d, t, q, and r is not 0," when construed independently of the surrounding claim language, should be given its general meaning, not be limited by surrounding claim language. Defendants' argument that such a reading renders the term meaningless is unfounded in the instant case because the surrounding claim language serves to sufficiently tailor "0≤d, t, q, r≤1, where at least one of d, t, q, and r is not 0" to what the '640 patent claims. For example, the construction of "having a formula: $Li_xM_{1-(d+t+q+r)}D_dT_tQ_qR_r(XO_4)$" requiring a 1:1 metal to polyanion ratio adopted above, which is also taken from Claim 1 of the '640 patent, sufficiently protects against the "nonsensical" formulas feared by Defendants—the only condition under which "$Li_xM_{1-(d+t+q+r)}D_dT_tQ_qR_r(XO_4)$" can work is when $0 \le d+t+q+r \le 1$. Defendants acknowledge this fact in their own proposed construction. Reading that limiting language into a separate construction of "0≤d, t, q, r≤1, where at least one of d, t, q, and r is not 0" is simply not proper. Accordingly, the Court adopts UT/HQ's construction.

G. *"X comprises"*

Term/Phrase	UT/HQ's Construction	Defendants' Construction
"*X comprises*" '640 patent: Claim 1	X includes, but is not limited to, Si, S, P, or V	X contains one or more of the elements listed (Si, S, P, V or mixtures thereof)

i. The Parties' Arguments in Support of Their Constructions

The parties dedicate the greatest amount of their briefing to the phrase "X comprises." UT/HQ contend that "[i]t is well established that 'comprises' dictates that a claim is open (i.e., 'including but not limited to') and that infringers cannot escape liability merely by adding something to the claim. (Pls.' Op. Br. 18). As evidence that this general rule should apply in the instant case as well, UT/HQ cite to intrinsic evidence in both the claim itself and the specification. In terms of the language of the contested claim itself, UT/HQ point to other language used in the claim that necessitates a traditional construction of "comprises." UT/HQ argue that whereas Claim 1 of the '640 Patent repeatedly uses the phrase "selected from the group consisting of" in reference to other components of the olivine compound, when it comes to X alone, the claim uses the term "comprises." UT/HQ contend that adopting Defendants' construction would essentially mean that "comprises" reads the same as "selected from the group consisting of," an untenable option under Federal Circuit precedent because different terms are presumed to have different meanings. (Pls.' Resp. Br. 24). In terms of the specification, UT/HQ note that the '640 patent explicitly contemplates elements other than Si, S, P, and V: "[r]edox energies of the host M cations can be varied by a suitable choice of the XO4 polyanion, where X is taken from Si, P, As, or S and the structure may contain a combination of such polyanions." (Pls.' Op. Br. 9 (quoting '640 patent at 5:36-41)).

Defendants acknowledge that "[t]he term 'comprising' is presumptively open-ended," but maintain that the presumption is overcome in Claim 1 of the '640 patent because the patentee "meant for the term to be closed." (Defs.' Op. Br. 24). Defendants first point to the claim language itself, arguing that a traditional, open-ended reading of "comprises" would render the term "or

mixtures thereof" meaningless because the claim could include mixtures anyway. (*Id.* at 24-25). Defendants also point to certain extrinsic declarations from UT/HQ's experts made during the reexamination process, arguing that statements made in these declarations indicate that the patentee's intended the term "comprises" to have a limited meaning. (*Id.* at 25). Next, Defendants contend that UT/HQ's construction would improperly allow X to include cobalt (Co), which, as reflected by their arguments in Section A above, would allow UT/HQ to now claim what they abandoned during reexamination. (*Id.*). Defendants also cite to two cases where courts applied the doctrine of collateral estoppel in arguing that the Court should be mindful of a Special Master's recommendation in a different proceeding concerning the same patent that the term "comprises" should be accorded a more limited meaning. (*Id.* at 26). Finally, in response to UT/HQ's assertion that the specification's reference to arsenic (As) indicates that the patentees intended an open-ended construction for "comprises," Defendants argue that the use of arsenic in the specification in fact refers to an unclaimed, non-olivine compound that the patentees purposely excluded from the claims. (Defs.' Ans. Br. 23).

UT/HQ respond to several of Defendants' arguments. UT/HQ first argue that Defendants' citation to certain specific embodiments as evidence that "comprises" should be limited is missplaced because claims should not be confined by specific embodiments provided in a specification. (Pls.' Resp. Br. 19 (citing *Phillips*, 415 F.3d at 1323). They also respond to Defendants' dismissal of the specification's mention of arsenic (As), arguing that the paragraph containing the statement about arsenic does in fact refer to the invention. (*Id.* at 25). In response to Defendants' contention that the traditional construction of "comprises" would render the term "mixtures thereof" meaningless, UT/HQ contend that the latter term still retains meaning, as it demonstrates that X can be some

element on its own, or a mixture of elements—it prevents an "opportunistic infringer" from arguing that the term "or" only allows one element not constitute X, not a combination of elements. (*Id.*). In response to Defendants' argument that UT/HQ's construction would improperly allow X to include cobalt (Co), UT/HQ point to their arguments in Section A above that they only evidence presented by Defendants in reference to cobalt relates to the elements that may constitute "M." (*Id.* at 26). In response to Defendants' collateral estoppel contentions, UT/HQ note that the Special Master's findings do not constitute a judgment on the merits, as required for the doctrine to apply. (*Id.* at 27). Finally, in response to the extrinsic declarations submitted by experts during reexamination, UT/HQ argue that Defendants misconstrue what the experts were saying. (*Id.* at 26).

ii. The Court's Analysis

The Court agrees wholly with UT/HQ's construction of the phrase "X comprises" and refuses to overturn the presumption that the term "comprises" is open-ended here. The term "comprising" is almost always open-ended, "rais[ing] a presumption that the list of elements is nonexclusive." *Dippin' Dots, Inc. v. Mosey*, 476 F.3d 1337, 1343 (Fed. Cir. 2007). This presumption may be overcome, however, if a party can demonstrate that the patentee meant for the term to be closed. *Id.* Here, Defendants have failed to so demonstrate.

First, the Court is unconvinced by Defendants' argument that an open-ended reading of "X comprises" renders the phrase "or mixtures thereof" superfluous. As UT/HQ point out, the phrase still retains an essential function: indicating that X can constitute either a single element or a mixture of elements. Without the phrase "or mixtures thereof," an infringer could argue that the phrase "Si, S, P, or V" indicates that the patentee intended for X to only include single elements,

despite the open-ended nature of "X comprises." Neither is the Court convinced that UT/HQ disclaimed cobalt in the context of "X" during reexamination. As discussed at length in Section A above, Defendants' references to prosecution history do not relate to "X" at all, rather they solely relate to "M."

Defendants' collateral estoppel arguments are similarly unconvincing. While Defendants never expressly argue that collateral estoppel definitively bars the Court from accepting UT/HQ's proposed construction, it is unambiguously implied. In the Fifth Circuit, collateral estoppel applies when: "(1) the identical issue was previously adjudicated; (2) the issue was actually litigated; and (3) the previous determination was necessary to the decision." *Pace v. Bogalusa City Sch. Bd.*, 403 F.3d 272, 290 (5th Cir. 2005). In general, courts in the Fifth Circuit find that collateral estoppel does not serve to bind courts to previous claim constructions, as claim constructions do not constitute final judgments on the merits. *See Paltalk Holdings, Inc. v. Microsoft Corp.*, No. 2:06cv367-DF, 2008 WL 4830571, at * 4 (E.D. Tex. July 29, 2008) (providing discussion and list of cases so holding). Here, collateral estoppel clearly does not apply—if a sister court's claim construction does not satisfy collateral estoppel, how much less so a special master's recommendation to the Court before a claim construction order is even issued.

In contrast to Defendants' rejected arguments, the Court is particularly convinced by UT/HQ's argument that a narrow reading of "comprising" would improperly cause that term to hold the same meaning as the phrase "selected from the group consisting of." Ordinarily, different words in a patent have different meanings. *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1119-20 (Fed. Cir. 2004). In defining the terms "M, "D," "T," "Q," and "R," Claim 1 of the '640 patent limits the potential satisfying elements with the phrase "selected from the group

consisting of." The parties have agreed that the phrase "selected from the group consisting of" means "one member selected from (and only from) the identified group individually." (*See* Joint Claim Construction Chart (Agreed Constructions) for the '640 patent at 1). In contrast to the patentees' employment of that phrase on those five separate occasions, they instead chose to define X as "compris[ing]" certain satisfying elements. Narrowly construing "X comprises" would eviscerate the patentee's purposes of using different terminology and effectively synonymize "comprising" with "selected from a group consisting of," an untenable result for this claim construction. Because the Court has found that the arguments Defendants offer to overcome the presumptively open-ended definition of "comprising," the Court need not determine whether the specification's listing of arsenic (As) as potentially constituting "X" relates to the claimed compounds in the patents-in-suit.

H. "M is at least one first-row transition-metal cation, where M is further defined as being a combination of cations, at least one of said cations being selected from the group consisting of Mn, Fe, Co, Ni, wherein M is $Fe_{1-x}Mn_x$ or $Fe_{1-x}Ti_x$ where $0 \leq x \leq 1$ "

Term/Phrase	UT/HQ's Construction	Defendants' Construction
"M is at least one first-row transition-metal cation, where M is further defined as being a combination of cations, at least one of said cations being selected from the group consisting of Mn, Fe, Co, Ni, wherein M is $Fe_{1-x}Mn_x$ or $Fe_{1-x}Ti_x$ where $0 \leq x \leq 1$ "	M is: two different cations of Fe; two different cations of Mn; a mixture of Fe and Mn cations in the proportions of $Fe_{1-x}Mn_x$ where $0<x<1$; or a mixture of Fe and Ti cations in the proportions of $Fe_{1-x}Ti_x$ where $0<x<1$	This claim term is contradictory and indefinite, and the claim is therefore invalid.

'382 patent: Claim 9 (Reexamined)		

i. The Parties' Arguments in Support of Their Constructions

Defendants argue that Claim 9 of the '382 patent, as set out above, is "insolubly ambiguous" and thus invalid. (Defs.' Op. Br. 27). In support of their contention, Defendants offer three examples of how the claim makes no sense. First, they point out that the claim requires that "M" be a combination of two or more first-row transition metal cations from the group of manganese (Mn), iron (Fe), cobalt (Co), or nickel (Ni), while at the same time providing (contradictorily in Defendants' eyes) that "M" cannot include cobalt or nickel ("M is . . . $Fe_{1-x}Mn_x$ or $Fe_{1-x}Ti_x$"). (*Id.* at 28). Second, Defendants argue that the inclusion of the phrase "$0 \leq x \leq 1$" similarly renders Claim 9 insolubly ambiguous because if $x=1$ in the formula $Fe_{1-x}Ti_x$, it would produce the compound $LiTiPO_4$, which Defendants allege contradicts the claim requirement that M be a combination of two or more first-row transition metal cations from the group of Mn, Fe, Co, or Ni. (*Id.*). Finally, Defendants contend that UT/HQ's construction inappropriately attempts to recharacterize the phrase "$0 \leq x \leq 1$" as "$0<x<1$" and should be rejected because the two have vastly different meanings and UT/HQ expressly refused to change Claim 9 to read "$0<x<1$" during reexamination. (*Id.* at 29-30).

UT/HQ argue that Claim 9 is not insolubly ambiguous. Instead, they maintain that the claim consists of four separate limitations. (Pls.' Op. Br. 22). If any of these limitations is not satisfied, an accused device does not fall within the scope of the claim. (*Id.*). Just because the limitations have different scopes with some being narrower than others, they argue, does not mean that the

limitations are "contradictory." (*Id.* at 24). After analyzing each of these limitations, UT/HQ then offer the following list of compounds that satisfy all four limitations and could possibly constitute "M" under Claim 9: "two different cations of Fe (such as Fe^{+2}/Fe^{+3}); two different cations of Mn (such as Mn^{+2}/Mn^{+3}); a combination of Fe and Mn cations in the proportions of $Fe_{1-x}Mn_x$ where $0<x<1$; and a combination of Fe and Ti cations in the proportions of $Fe_{1-x}Ti_x$ where $0<x<1$." (*Id.*). They further respond to Defendants' arguments concerning the fact that the claim would allow "M" to be Ti alone, contending that that option is foreclosed by two of the limitations—"M" must be a combination of cations and that it must come from the group of Mn, Fe, Co, and Ni. In fact, UT/HQ allege, Defendants cannot point to "any cation or combination of cations for which it is ambiguous whether each limitation of Claim 9 is met." (*Id.* at 30). In response to Defendants' contention that they have improperly recast "$0\leq x\leq 1$" as "$0<x<1$," UT/HQ argue that their construction in fact considers all potential scenarios: $x=0$, $0<x<1$, and $x=1$. (*Id.*).

In responding to UT/HQ's contentions, Defendants contend that UT/HQ's explanation of their proposed construction inappropriately attempts to "redraft" the explicit limitations in order to salvage an invalid claim. (Defs.' Ans. Br. 26). First, they argue that as a matter of law courts cannot redraft claim language. (*Id.*). Second, they maintain that even if such redrafting was allowed, UT/HQ does not provide one single, clear way to change the claim, instead proffering several different ways to redraft the claim to make it valid. (*Id.*). In particular, Defendants point to UT/HQ's alleged recharacterization of the phrase "$0\leq x\leq 1$" as "$0<x<1$" and UT/HQ's limitation of "M" to only "combinations of cations of Fe, combinations of cations of Mn, combinations of cations of Fe and Mn, and combinations of Fe and Ti." (*Id.* (quoting UT/HQ's Op. Br. 23-24)).

ii. The Court's Analysis

The Court once again adopts UT/HQ's construction and rejects Defendants' argument that Claim 9 of the '640 patent is not insolubly ambiguous. A claim that is "indefinite" is invalid. *Halliburton Energy Servs., Inc. v. M-I LLC*, 514 F.3d 1244, 1249 (Fed. Cir. 2008). A claim is only "indefinite" if it is either "not amenable to construction" or "insolubly ambiguous." *Id.* at 1250. The standard for proving that a claim is indefinite or insolubly ambiguous is stringent: "[a]n accused infringer must . . . demonstrate by clear and convincing evidence that one of ordinary skill in the relevant art could not discern the boundaries of the claim based on the claim language, the specification, the prosecution history, and the knowledge in the relevant art." *Haemonetics Corp. v. Baxter Healthcare Corp.*, 607 F.3d 776, 783 (Fed. Cir. 2010).

Claim 9 is merely a list of conditions that serve to greatly restrict the compounds that it claims. Some compounds fail to satisfy one of these conditions; other compounds fail to satisfy several of these conditions. Just because a compound might fail one of these conditions, that does not necessarily mean, as Defendants argue, that the compound's satisfaction of one of the other conditions renders the claim meaningless. To the contrary, the only way that Claim 9 of the '640 patent would be insolubly ambiguous would be if there were no compound that could satisfy its requirements. As evidenced by UT/HQ's construction, that is simply not the case. UT/HQ's construction properly accounts for every possible claimed compound that satisfies each of the conditions. It does not, as Defendants allege, attempt to recharacterize the phrase "$0 \leq x \leq 1$" as "$0 < x < 1$." Instead it provides the potentially claimed compounds for each of $x=0$, $0<x<1$, and $x=1$. Neither is UT/HQ's proposed construction an example of "redrafting"—instead, it is merely a clarification of the result of all the conditions delineated in the claim. Accordingly, the Court finds

that Claim 9 of the '382 patent is not insolubly ambiguous and adopts UT/HQ's proposed construction.

IV.

CONCLUSION

For the reasons set forth fully above, the Court hereby adopts the following constructions for the disputed claim language:

Term/Phrase	Court's Construction
"*compound*" '382 patent: Claims 1, 6, 10, and 11 '640 patent: Claims 1 and 3	no separate construction necessary
"*formula*" '640 patent: Claim 1	a written representation using symbols of a chemical entity or relationship
"*ordered olivine compound having the formula $LiMPO_4$ where M is a first-row transition-metal cation selected from the group consisting of . . .*" '382 patent: Claims 1 and 6	an ordered olivine compound composed of atoms in the following relationship: only one lithium (Li), one and only one metal M (Fe, Mn, Ni, or Ti), and only one phosphate (PO_4)
"*ordered olivine compound having the formula $LiMPO_4$ where M is one or more first-row transition metals selected from the group consisting of . . .*" '382 patent: Claims 10 and 11	an ordered olivine compound composed of atoms in the following relationship: only one lithium (Li), one and only one metal M (Fe, Mn, Ni, or Ti, or a combination thereof), and only one phosphate (PO_4)
"*having a formula:* $Li_xM_{1-(d+t+q+r)}D_dT_tQ_qR_r(XO_4)$" '640 patent: Claim 1	the formula composed of atoms in the following relationship: x units of lithium (Li), one (1) unit of metals (which is a combination of at least two metals independently selected from M, D, T, Q and T that total one (1) unit of metals), and one (1) unit of XO_4

"*0 ≤d, t, q, r ≤1, where at least one of d, t, q, and r is not 0*" '640 patent: Claim 1	each of d, t, q and r are greater than or equal to 0, and less than or equal to 1. In addition, at least one of d, t, q, and r is greater than zero
"*X comprises*" '640 patent: Claim 1 '382 patent: Claims 2 and 7	X includes, but is not limited to, Si, S, P, or V
"*M is at least one first-row transition-metal cation, where M is further defined as being a combination of cations, at least one of said cations being selected from the group consisting of Mn, Fe, Co, Ni, wherein M is* $Fe_{1-x}Mn_x$ *or* $Fe_{1-x}Ti_x$ *where* $0 \leq x \leq 1$ " '382 patent: Claim 9 (Reexamined)	M is: two different cations of Fe; two different cations of Mn; a mixture of Fe and Mn cations in the proportions of $Fe_{1-x}Mn_x$ where $0<x<1$; or a mixture of Fe and Ti cations in the proportions of $Fe_{1-x}Ti_x$ where $0<x<1$

A Status Report Order will issue shortly, directing the parties to propose dates for the remaining deadlines in this case.

SO ORDERED.

DATED March 29, 2011

JANE J. BOYLE
UNITED STATES DISTRICT JUDGE